1. - 2. (Canceled)

3. (Previously presented) An atrial defibrillator, comprising:

a portable, non-implanting housing;

a pair of defibrillator pads operable to be applied to the outside of a patient's body;

a shock generator disposed in housing, coupled to the pads, and operable to shock the patient via the pads;

an analyzer disposed in the housing and operable to receive a cardiac signal from the patient, to determine from the signal whether the patient is experiencing atrial fibrillation, and to enable the shock generator if the patient is experiencing atrial fibrillation; and

a safety device disposed in the housing and operable to prevent the patient from activating the shock generator.

4. (Previously presented) An atrial defibrillator comprising:

a portable, non-implanting housing;

a pair of defibrillator pads operable to be applied to the outside of a patient's body;

a shock generator disposed in the housing, coupled to the pads, and operable to shock the patient via the pads;

an analyzer disposed in the housing and operable to receive a cardiac signal from the patient, to determine from the signal whether the patient is experiencing atrial fibrillation, and to enable the shock generator if the patient is experiencing atrial fibrillation; and

a verification device disposed in the housing and operable to prevent an unauthorized person from activating the shock generator.

5. (Canceled)

6. (Previously presented) An atrial defibrillator, comprising:

a portable, non-implantable housing;

a pair of defibrillator pads operable to be applied to the outside of a patient's body;

a shock generator disposed in the housing, coupled to the pads, and operable to shock the patient via the pads;

an analyzer disposed in the housing and operable to receive a cardiac signal from the patient, to determine from the signal whether the patient is experiencing atrial fibrillation, and to enable the shock generator if the patient is experiencing atrial fibrillation;

wherein the cardiac signal comprises an electrocardiogram having R-R intervals; and

the analyzer is operable to determine whether the patient is experiencing atrial fibrillation by;

measuring the durations of the R-R intervals,

calculating the respective differences between the lengths of contiguous ones of the R-R intervals,

comparing the calculated differences to a difference threshold, and

determining that the patient is experiencing atrial fibrillation if one of the calculated differences exceeds the threshold.

7. (Previously presented) An atrial defibrillator, comprising:

a portable, non-implantable housing;

a pair of defibrillator pads operable to be applied to the outside of a patient's body;

a shock generator disposed in the housing, coupled to the pads, and operable to shock the patient via the pads;

an analyzer disposed in the housing and operable to receive a cardiac signal from the patient, to determine from the signal whether the patient is experiencing atrial fibrillation, and to enable the shock generator if the patient is experiencing atrial fibrillation;

wherein the cardiac signal comprises an electrocardiogram having R-R intervals; and

wherein the analyzer is operable to determine whether the patient is experiencing atrial fibrillation by;

measuring the durations of a first group of the R-R intervals,

calculating the respective differences between the durations of contiguous ones of the R-R intervals in the first group,

comparing the calculated differences to a difference threshold,

repeating the measuring, calculating, and comparing for a second group of the R-R intervals, and

determining that the patient is experiencing atrial fibrillation if one of the first-group differences and one of the second-group differences exceed the threshold.

8. (Previously presented) An atrial defibrillator, comprising:

a portable, non-implantable housing;

a pair of defibrillator pads operable to be applied to the outside of a patient's body;

a shock generator disposed in the housing, coupled to the pads, and operable to shock the patient via the pads;

an analyzer disposed in the housing and operable to receive a cardiac signal from the patient, to determine from the signal whether the patient is experiencing atrial fibrillation, and to enable the shock generator if the patient is experiencing atrial fibrillation;

a memory coupled to the analyzer and operable to store a normal QRS signal of the patient;

wherein the cardiac signal comprises an electrocardiogram having QRS signals and R-R intervals; and

wherein the analyzer is operable to determine whether the patient is experiencing atrial fibrillation by;

measuring the durations of the R-R intervals,

calculating respective R-R differences between the lengths of contiguous ones of the R-R intervals,

comparing the calculated R-R differences to an R-R threshold,

calculating a QRS difference between one of the QRS signals of the cardiac signal and the stored QRS signal,

comparing the calculated QRS difference to a QRS threshold, and

determining that the patient is experiencing atrial fibrillation if one of the R-R differences equals or exceeds the R-R threshold and the QRS difference is less than the QRS threshold.

9. (Previously presented) An atrial defibrillator, comprising:

a portable, non-implantable housing;

a pair of defibrillator pads operable to be applied to the outside of a patient's body;

a shock generator disposed in the housing, coupled to the pads, and operable to shock the patient via the pads; and

an analyzer disposed in the housing and operable to receive a cardiac signal from the patient, to determine from the signal whether the patient is experiencing atrial fibrillation, and to enable the shock generator if the patient is experiencing atrial fibrillation;

wherein the cardiac signal comprises an electrocardiogram having R-R intervals; and

wherein the analyzer is operable to determine whether the patient is experiencing atrial fibrillation by;

measuring the durations of the R-R intervals,

calculating respective differences between the lengths of contiguous ones of the R-R intervals,

comparing the calculated differences to a difference threshold,

determining the patient's heart rate,

determining whether the patient's heart rate is within a predetermined range of heart rates, and

determining that the patient is experiencing atrial fibrillation if one of the differences exceeds the threshold and the heart rate is within the predetermined range.

10. (Canceled)

11. (Previously presented) An atrial defibrillator, comprising:

a portable, non-implantable housing;

a pair of defibrillator pads operable to be applied to the outside of a patient's body;

a shock generator disposed in the housing, coupled to the pads, and operable to shock the patient via the pads;

an analyzer disposed in the housing and operable to receive a cardiac signal from the patient, to determine from the signal whether the patient is experiencing atrial fibrillation, and to enable the shock generator if the patient is experiencing atrial fibrillation;

wherein the cardiac signal comprises an electrocardiogram having R-R intervals; and

wherein the analyzer is further operable to determine from the cardiac signal whether the atrial fibrillation terminates after the shock generator shocks the patient by;

measuring the lengths of the R-R intervals,

calculating respective differences between the lengths of continuous ones of the R-R intervals,

comparing the calculated differences to a difference threshold, and

determining that the atrial fibrillation is terminated if one of the calculated differences is less than the difference threshold.

12. (Canceled)

13. (Previously presented) A nonsurgical method of treating atrial fibrillation, comprising:

transdermally receiving a cardiac signal from a patient by a transdermal electrode;

determining from the signal with a portable external analyzer whether the patient is experiencing atrial fibrillation;

determining the presence of an authorized operator;

enabling a portable shock generator with a signal from the portable analyzer;

receiving a shock command from an authorized operator; and

shocking the patient with the portable shock generator by means of the transdermal electrode in response to the shock command if the patient is experiencing atrial fibrillation.

14. (Previously presented) A nonsurgical method of treating atrial fibrillation, comprising:

receiving a cardiac signal from a patient;

determining from the signal with a portable external analyzer whether the patient is experiencing atrial fibrillation;

informing the patient by means of the analyzer that the patient is experiencing atrial fibrillation;

receiving a shock command from an operator; and

shocking the patient with a portable shock generator in response to the shock command if the patient is experiencing atrial fibrillation, further comprising:

applying defibrillator pads to the patient;

wherein the receiving comprises receiving the cardiac signal via the pads, and

wherein the shocking comprises shocking the patient via the pads.

15. (Previously presented) A method, comprising:

receiving a cardiac signal from a patient;

determining from the signal whether the patient is experiencing atrial fibrillation;

receiving a shock command from an operator; and

shocking the patient with a portable shock generator in response to the shock command if the patient is experiencing atrial fibrillation,

wherein the determining comprises:

measuring the lengths of R-R intervals in the signal;

calculating the respective differences between the lengths of contiguous ones of the R-R intervals;

comparing the calculated differences to a difference threshold; and

determining that the patient is not in atrial fibrillation if one of the calculated differences is less than the difference threshold.

16. (Previously presented) A method, comprising:

receiving a cardiac signal from a patient;

determining from the signal whether the patient is experiencing atrial fibrillation;

shocking the patient with a portable shock generator if the patient is experiencing atrial fibrillation;

storing a normal QRS signal of the patient; and

wherein the determining comprises;

measuring the lengths of R-R intervals of the cardiac signal,

calculating the respective differences between the lengths of contiguous ones of the R-R intervals,

comparing the calculated differences to an R-R threshold,

calculating a difference between a QRS signal of the

cardiac signal and the stored QRS signal,

comparing the calculated QRS difference to a QRS threshold, and

determining that the patient is not in atrial fibrillation if one of the calculated differences is less than the R-R threshold or if the QRS difference is greater than or equal to the QRS threshold.

17. (Previously presented) A nonsurgical method of treating atrial fibrillation, comprising:

transdermally receiving a cardiac signal from a patient;

determining from the signal whether the patient is experiencing atrial fibrillation;

verifying the presence of an authorized operator;

applying a shock enable signal to a portable shock generator if the patient is experiencing atrial fibrillation;

shocking the patient with the portable shock generator external to the patient if the patient is experiencing atrial fibrillation and an authorized operator is present; and

wherein the determining comprises,

determining the patient's heart rate and

determining that the patient is not in atrial fibrillation if the heart rate is outside of a predetermined range.

18. (Previously presented) The method of claim 13, further comprising determining from the cardiac signal with the portable analyzer whether the atrial fibrillation terminates after shocking the patient.

19. (Original) The method of claim 13 wherein the shocking comprises shocking the patient during a rising edge of an R wave in the cardiac signal.

20. (Original) A method, comprising:

receiving a cardiac signal from a patient;

determining from the signal whether the patient is experiencing atrial fibrillation;

identifying an operator of a shock generator;

enabling the shock generator if the operator is authorized to operate the shock generator; and

shocking the patient with the shock generator in response to a shock command from the operator if the patient is experiencing atrial fibrillation.

21. (Original) The method of claim 20, further comprising disabling the shock generator if the operator is identified as the patient.

22. (Previously presented) The method of claim 20 wherein the patient is the operator.

23. (Previously amended) An atrial defibrillator, comprising:

a portable, non-implantable housing;

a pair of defibrillator pads operable to be applied to the outside of a patient's body;

a shock control operable to allow a patient to defer a self-administered shock;

a shock generator disposed in the housing and responsive to the shock control, coupled to the pads, and operable to shock the patient via the pads with a multi-phasic waveform; and

an analyzer disposed in the housing and operable to receive a cardiac signal from the patient, to determine from the signal whether the patient is experiencing atrial fibrillation, and to enable the shock generator if the patient is experiencing atrial fibrillation.